

National Security Education Center

UNCLASSIFIED

Information Science and Technology Seminar Speaker Series



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Missouri University of Science and Technology

Securing Cyber-Physical Critical Infrastructures in Smart Living Environments

Wednesday, December 10, 2014

3:00 - 4:00 PM

TA-3, Bldg. 1690, Room 102 (CNLS Conference Room)

Abstract: We live in an era in which our physical and personal environments are becoming increasingly smarter as they are immersed in sensing, networking, computing and communication capabilities. Indeed our daily lives depend on various cyber-physical infrastructures such as smart buildings, energy and utility networks, transportation and healthcare delivery systems, supply chain management, and so on. Additionally, the availability of rich mobile devices like smartphones and wireless sensors have empowered humans as an integral part of such systems. This synergy has led to what is called cyber-physical-social convergence exhibiting complex interactions, interdependencies and adaptations between devices, machines, systems/environments, and users with their social behavior and dynamics. In such a connected world, almost everything can potentially act as information source, analyzer, and decision maker. However, due to the scale, complexity and resource limitations, cyber-physical-social infrastructures are vulnerable to failures and security threats. This talk will discuss emerging research challenges in securing such infrastructures and propose novel frameworks for situation-aware detection and mitigation of attacks as well as recovery techniques. The proposed solutions will utilize sensor based monitoring and information fusion techniques based on a rich set of theoretical and practical design principles, such as game theory, trust model, information theory, epidemic theory, and statistical learning. The talk will be concluded with open research issues and challenges.

Biography: Dr. Sajal K. Das is the Chair of Computer Science Department and Daniel St. Clair Endowed Chair at Missouri University of Science and Technology, Rolla. During 2008-2011, he was a Program Director at NSF in the Computer Networks and Systems Division. During 1999-2013 he was a University Distinguished Scholar Professor of Computer Science and Engineering, and founding director of Center for Research in Wireless Mobility and Networking (CRWMan) at the University of Texas at Arlington. In 2012 Dr. Das was selected as E.T.S. Walton Fellow by the Science Foundation of Ireland. Prior to 1999, he was a Professor of Computer Science at University of North Texas, Denton. He is frequently invited as a keynote speaker at international conferences and workshops, and has visited numerous universities worldwide for collaborative research and invited seminars.

His research interests include wireless and sensor networks, mobile and pervasive computing, distributed and cloud computing, cyber-physical systems and smart environments including smart grid and smart healthcare, security and privacy, biological and social networks, applied graph theory and game theory. He has contributed significantly to these areas, and published over 500 research articles in journals and conferences, and 49 book chapters. He directed numerous funded projects, holds 5 US patents, and coauthored three books – Smart Environments: Technology, Protocols, and Applications (Wiley 2005); Handbook on Securing Cyber-Physical Critical Infrastructure: Foundations and Challenges (Morgan Kaufman 2012); and Mobile Agents in Distributed Computing and Networking (Wiley 2012). He is a recipient of the IEEE Computer Society's Technical Achievement Award for pioneering contributions in sensor networks and mobile computing; IEEE Region -5 Outstanding Engineering Educator Award; and 9 Best Paper Awards including those at IEEE SmartGridComm'12, IEEE PerCom'06, and ACM MobiCom'99. At UT Arlington, he was a recipient of the Graduate Dean's Award for Excellence in Mentoring Doctoral Students, Lockheed Martin Award for Teaching Excellence, College of Engineering Research Excellence Award, UTA Academy of Distinguished Scholars Award, and University Award for Distinguished Record of Research.

Dr. Das is the founding Editor in Chief of Elsevier's *Journal of Networked Systems Management* and Associate Editor of IEEE *Transactions on Systems, Man, and Cybernetics - Part A*.

For more information contact the technical host Alex Kent, alex@lanl.gov, 216-6191.

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